

A STUDY OF ABNORMAL NESTS OF BAYA WEAVER BIRD *PLOCEUS PHILIPPINUS* (LINN.) IN RAJASTHAN¹

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(With six text-figures)

Key words: abnormal nests, monostoreyed nests, multistoreyed nests, symmetry, simple harmonic motion, storeyfication, nest fusion

The Baya Weaver Bird *Ploceus philippinus* (Linn.) is a colonial nester. Besides normal nests, various types of abnormal nests are fabricated by cocks during breeding period. Many abnormalities can be seen in nests of Bayas, either structural or orientational or both. Keeping abnormalities in view, as many as 16 types of abnormal nests were observed in Rajasthan. There is a trend towards bistoreyed nests followed by fused nests.

This paper describes a field study of various qualitative and quantitative aspects of abnormal nesting in sexually mature male Baya weaver bird *Ploceus philippinus* (Linn.). Besides a few stray notes and papers that had appeared in various journals (Jesse 1897, Prater 1932, Ali and Ambedkar 1956, Ambedkar 1964, 1980; Crook 1964, Sharma 1985, 1988; Davis 1985) no systematic study has been done so far on this aspect. Ambedkar (1980) has given a good account of multistoreyed and composite nests. Sharma (1985) gives a detailed account of some qualitative aspects of abnormal nesting in Baya Weaver Bird *Ploceus philippinus* (Linn.).

STUDY AREA

The study was carried out mainly in four districts, namely Alwar, Bharatpur and Jaipur of eastern Rajasthan and Udaipur in southern Rajasthan.

Eastern Rajasthan is a fairly plain area receiving an average annual rainfall of 675 mm. The southern part of the state is hilly and receives more rainfall (up to 1000 mm.).

MATERIALS AND METHODS

A large number of nest colonies of *Ploceus philippinus* (Linn.) were observed in the agricultural fields, ravines, forest fringes and area around water bodies. Abandoned abnormal nests were collected at the end of the monsoon rains when breeding activities of weaver birds come to an end. Parent birds then, leave their nests along with the juveniles. Nests were collected by a bamboo, having sharp hook at its upper end. When nests were beyond reach, their sketches were made on paper or they were photographed at the spot. Internal structure of the nest was examined by bisecting the nests at different planes, using scissors.

GENERAL PLAN OF A NORMAL NEST

A typical completed nest of *P. philippinus* (Linn.) is a bottle shaped structure and can be divided into three parts - stalk, body and entrance tube. A normal completed nest of *P. philippinus* (Linn.) has its entrance tube slightly shifted towards the entrance-hall side due to which more bulging appears towards the egg-chamber. Due to this position of the entrance tube a completed nest can be divided into two equal halves across the chin-strip only, hence

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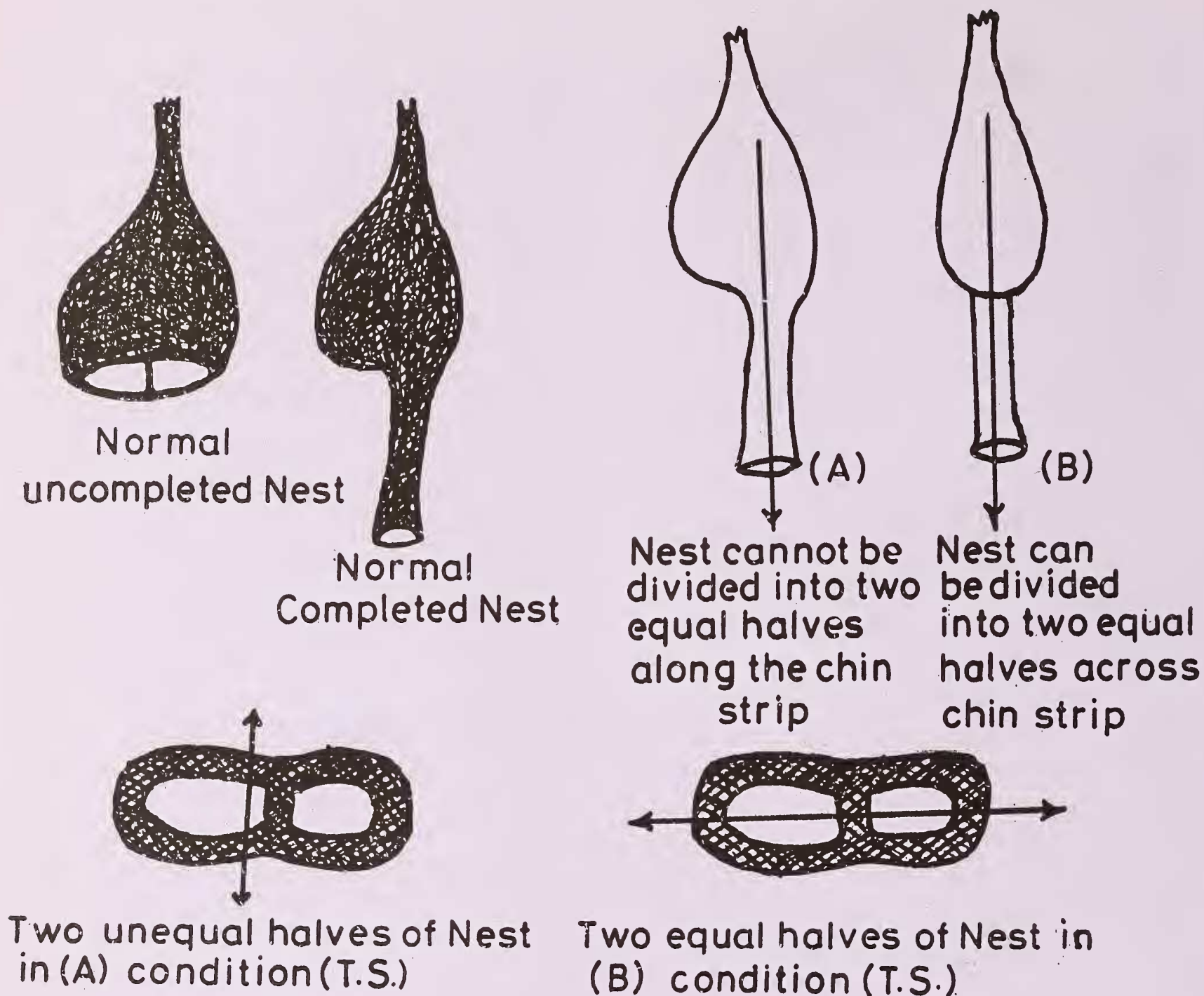


Fig. 1. Symmetry of normal completed nest at two planes.

they are zygomorphic in terms of symmetry (Fig. 1).

Incomplete nests are precursors of completed nests. They are bell shaped in structure, lacking an entrance tube and the characteristic 'dome' of the egg-chamber (Fig. 2).

Details of structure of normal nests are given elsewhere (Ali 1931, Ali and Ambedkar 1956, 1957; Ambedkar 1958, 1964; Crook 1960, Mathew 1976, Sharma 1985).

QUALITATIVE ASPECTS OF ABNORMAL NESTS

Besides typical nests, which are otherwise called normal nests, various types of abnormal nests are prepared by sexually mature male birds during breeding season. Many variations can be seen in nests of Bayas which make a nest abnormal.

A. Abnormality in structure of nest or any part of it. Abnormal structure(s) may appear due to:

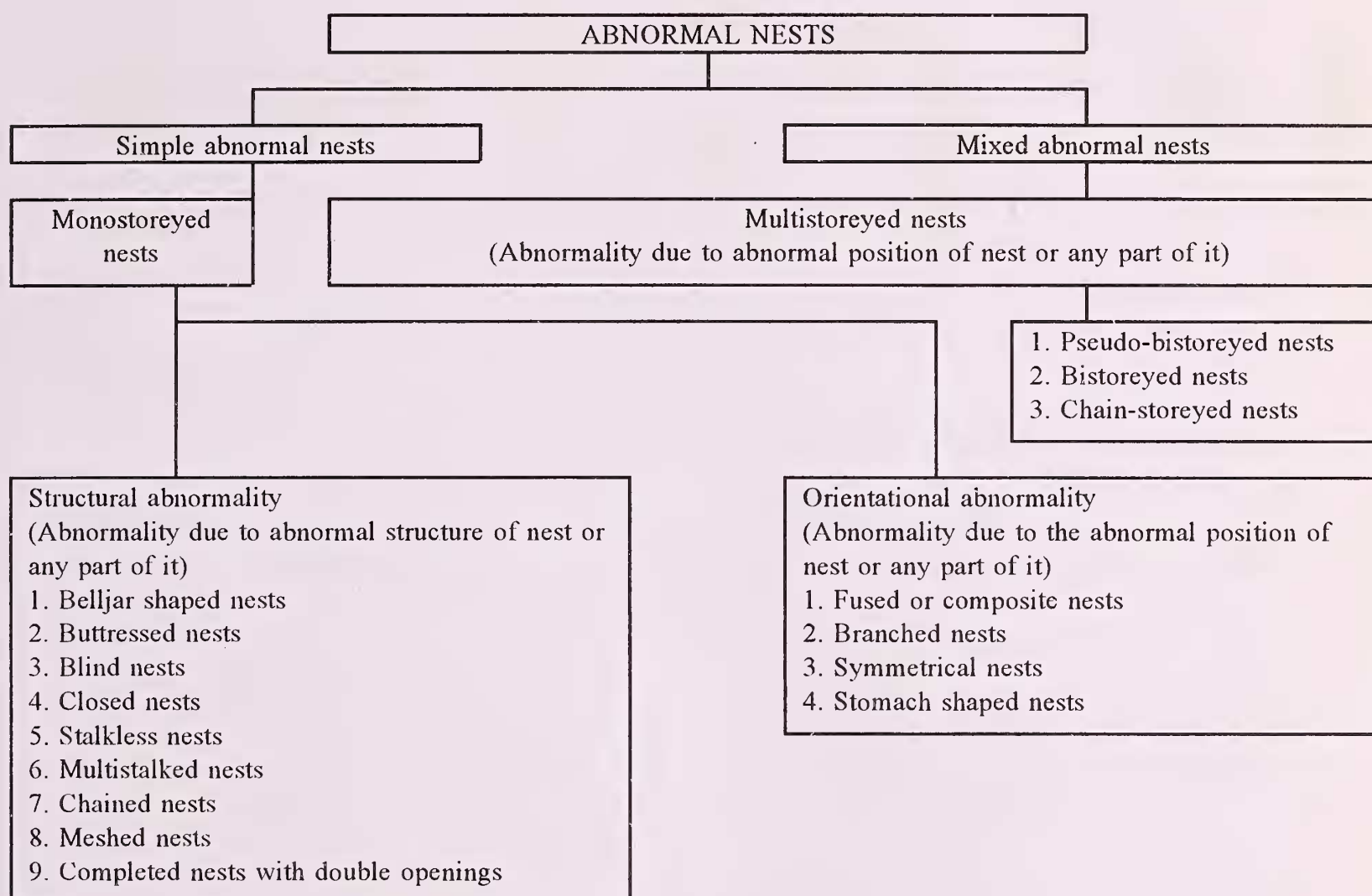
- (i) Duplication of part(s), or/and
- (ii) Formation of additional part(s), or/and
- (iii) Elaboration of normal part(s), or/and
- (iv) Abolition of normal part(s).

B. Abnormality in position of nest or any part of it.

As indicated above, there may be many kinds of abnormalities. When one type of abnormality is present in nest it may be called a

ormal nests in their construction and general plan. Each individual monostoreyed nest possesses only one egg chamber in the only storey-hence monostoreyed. Details of different kinds of monostoreyed nests are given in Fig. 2.

Belljar shaped nests: These are completed nests with very wide entrance tube through out or most of its length. Though lower most part of the entrance tube may become dilated due to



simple abnormal nest and when more than one type of abnormalities appear in it, it may be called mixed or complex abnormal nest.

A simple classification of abnormal nests is given in the diagram.

A. MONOSTOREYED NESTS:

A class of simple nests, much similar to

continuous clinging on by the bird in normal nests also, but in belljar-shaped nests widening could be seen throughout length of tube. Rather it is structural widening which does not appear due to clinging.

Buttressed nests: In certain cases a mesh of woven fabrics may occur at any angular region of nest. It was noticed that such type of mesh always occurs vertically on the body of the nest,

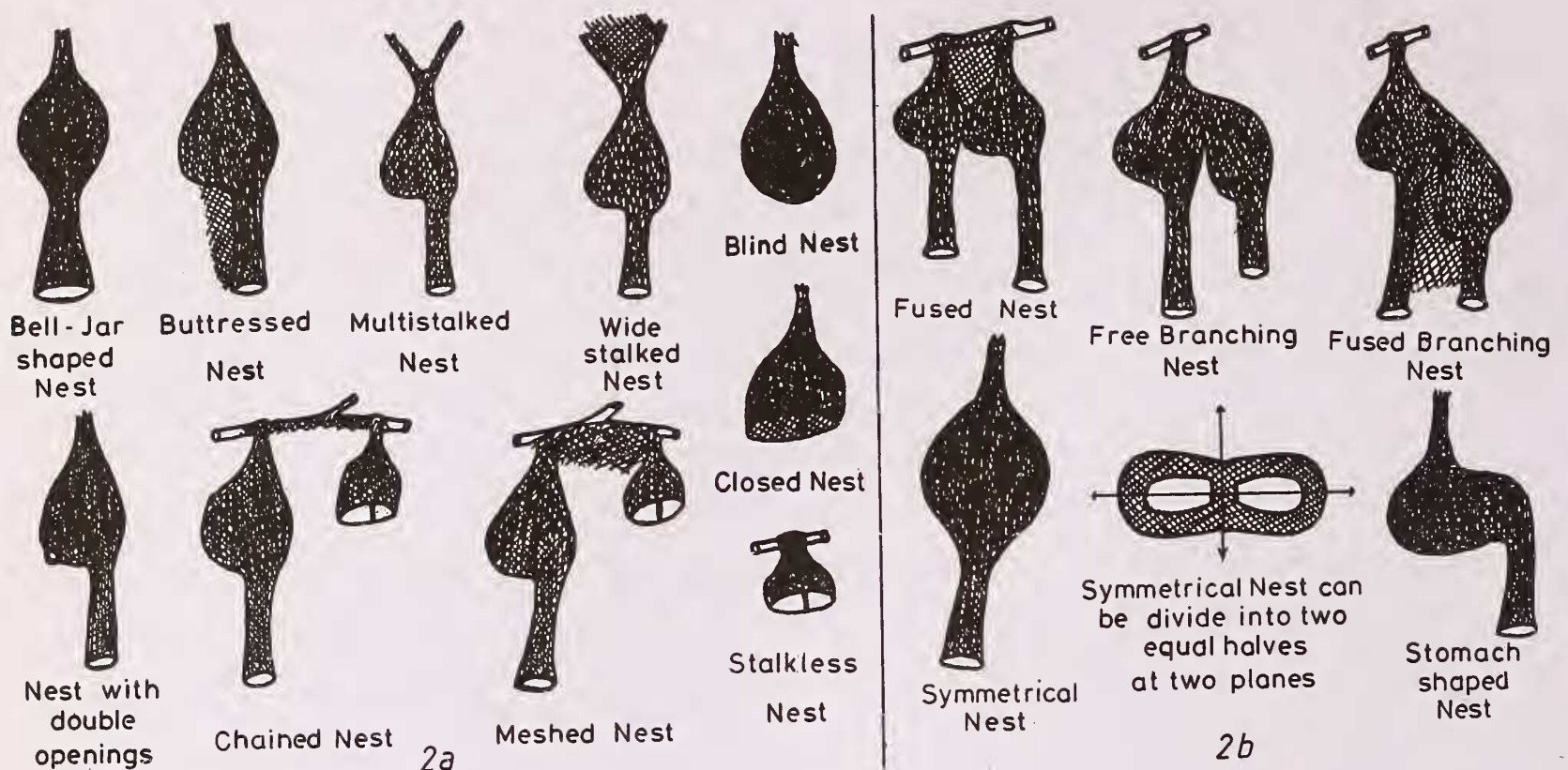


Fig. 2a. Mono-storeyed nests of various kinds with structural abnormalities;
2b. Mono-storeyed nests with orientational abnormalities.

i.e. across the chin strip on either the outer front wall of the egg chamber or the entrance hall. Sharma (1988) has described such nests elsewhere.

Blind nests: Sometimes a denser mesh may occur on both the openings of a half built nest, making it tightly closed. Such nests when viewed externally give no clue of openings. These club shaped nests having a short stalk, look like a spherical mass (Davis 1985).

Closed nests: These are completed or uncompleted nests, which resemble blind nests, but their opening(s) could be traced externally due to the presence of thin mesh over the opening(s).

Stalkless nests: Stalkless nests are fabricated by *Ploceus benghalensis* and *P. manyar* in reeds and grasses. *Ploceus philippinus* is a bird which fabricates stalked nest on trees

and high bushes, but in certain cases stalkless nests could be seen in nature. Stalkless nests are hardly ever accepted by female birds, hence they are seldom completed by the cock.

Multistalked nests: In normal cases only one stalk is fabricated by the cock. But, in many cases more than one stalk may occur, hence multistalked nest. The presence of two or more stalks provide extra attachment strength to the nest. Such type of nests are common on *Phoenix sylvestris*. It is the height of the *P. sylvestris* which makes a hanging nest prone to simple harmonic motion on windy days. Hence, to minimize such a pendulous motion more than one pinnae are involved for stalking the nest.

Some times the gap between two stalks is blocked by a woven mesh, due to which a nest becomes 'wide stalked nest'. This device is equally good to minimize the simple harmonic motion.

Chained nests: In normal cases a male bird keeps a distance between two successive nests hanging on the same branch. No physical contact is seen between the nests; but sometimes nests could be joined with a mesh of woven fibres which is fabricated along and around the twig itself. This is the simplest way to join the nests. Actual nests remain normal in structure.

Meshed nests: Often, instead of making a mesh around the twig, it is extended beneath the twig on which nests are hung. This flap like mesh is used to join the down stalk angular point of the top nest with the upper stalk angular point of the lower nest (Sharma 1988).

Completed nests with double openings: Though uncompleted nests always contain two openings, a typical completed nest possesses only one for use. An additional opening with an additional very small tube was seen in a completed nest in 1980 on National Highway 11 near village Hantara in District Bharatpur (unpublished). This particular nest held eggs at the time of observation and double openings were maintained right from the pre-hatching stages, hence the nest was a truly double opening nest.

It was observed that sometimes an additional opening may be created in those nests which have fledglings about to leave the nest. This opening is created near the egg chamber to shorten the length of the entrance tube so that the number of feeding trips could be increased for growing chicks. This is the case where double openings are maintained during the post-hatching stage. Hence such nests are not truly double opening nests.

Fused nests or Composite nests: Distance between two nests, in chained and meshed kind is kept shorter so that they could be linked easily. In both the cases linking is very loose and nests do not come in direct contact. Some times this inter-nest distance is further reduced

and two or more successive nests are made side by side in physical contact. Various degrees of fusion could be seen between two closely hanging nests. Their fusion may be partial or total. Actually, a fused nest is an aggregation of parallelly fused two or more completed or/and uncompleted nests. It is remarkable to note that the base of the each individual nest of a 'fused complex' has independent attachment on branch(es) of the host tree. Fused nests have been recorded from different parts of the country by Prater (1932) and Ambedkar (1980) also.

Branched nest: In fused nests, all individual nests of a 'fused complex' seek their attachment on twig(s) but this attachment pattern is not followed in a branched nest. In such a nest, besides one (main nest), the side nest(s) commences from any part of the main nest, except from the bottom of the tube. Due to this abnormal hanging pattern of individual nests, a branching nest comes into existence. Branched nests may be of two types:

- i) *Free branching nest:* Branches, i.e. side nests are not fused with the main nest.
- ii) *Fused branching nest:* Side nests are fused with the main nest. Such nests may be either 'partially fused' or 'totally fused' according to the degree of fusion.

Symmetrical nests: The position of the egg chamber and the entrance hall could be identified in ordinary completed nests due to the position of the entrance tube, which occurs slightly shifted towards the entrance hall side. Not only this, but a greater bulge could be seen towards the egg-chamber half also. Such a nest could be divided into two equal halves from one plane only, i.e. across the chin-strip.

Sometimes the entrance tube is kept exactly centered so that both halves get similar bulges. In such a condition, even an expert could make mistakes in identifying the egg-chamber half externally. Such nest could be divided into two

equal halves at two different planes (perpendicular to each other) - across the chin-strip and along the chin-strip; hence such nests are actinomorphic in terms of symmetry.

Stomach shaped nests: In ordinary cases the stalk is seen towards the upper terminal portion of the nest and all the three parts of a completed nest, namely stalk, body and tube remain in a straight vertical line. In stomach-shaped nest, alignment of the nest becomes disturbed and the stalk and the tube take a more or less perpendicular position on the body of the nest. Due to this abnormal position of the stalk and tube a nest looks like a human stomach in appearance - hence stomach shaped nest.

B. MULTISTOREYED NESTS:

A complicated group of nests, generally possessing more than one egg-chamber in a series vertically, and more than one storey built in the same fashion - hence, multistoreyed. Actually a multistoreyed nest is a linear fusion of two or more monostoreyed nests along their vertical axes in a series. Ambedkar (1980) called such nests as 'abnormal multi-chambered linear nest'. Details of multistoreyed nests are given below:

Pseudo-bistoreyed nests: These are completed nests, basically monostoreyed in structure, having one egg chamber like a normal nest; but they present a false appearance of being double egg chambered and double storeyed, externally. Upper storey of such nests having no cavity, i.e. totally solid due to woven mass of fabrics. It is the lower storey which contains egg-chamber in it (see Fig. 3).

Bistoreyed nests: These are truly bistoreyed, formed by the fusion of two completed or two half completed or one completed and one half completed nest in vertical plane, i.e. along their vertical axes. Such



Pseudo-
bistoreyed
Nest



Pseudo
bistoreyed
Nest in L.S.

Fig. 3. Pseudo-bistoreyed nest (0 + 1 Storey).

nests having two storeys, have two egg-chambers in reality. In such complicated nests the lower nest commences from the bottom of the entrance tube of the upper nest. In most of the cases the upper storey is useless as the entrance is closed up by the lower nest (see Fig. 4).

³**Chain-storeyed nests:** Chain storeyed nests are more complicated than the bistoreyed and are formed when more than two nests are fused along their vertical axes in a series. In Rajasthan state, only three storeyed nests have been observed during the study period so far, though a 'six storeyed' nest had been recorded from Pune by Ambedkar (1980); but in the present classification of abnormal nests, Ambedkar's six storeyed nest will be kept under

³Chain-storeyed nests were described as poly-storeyed nests by Sharma (1985). Because the term multistoreyed and polystoreyed are synonymous hence to differentiate them, term 'chain-storeyed nest' is used for polystoreyed nest in the present paper.

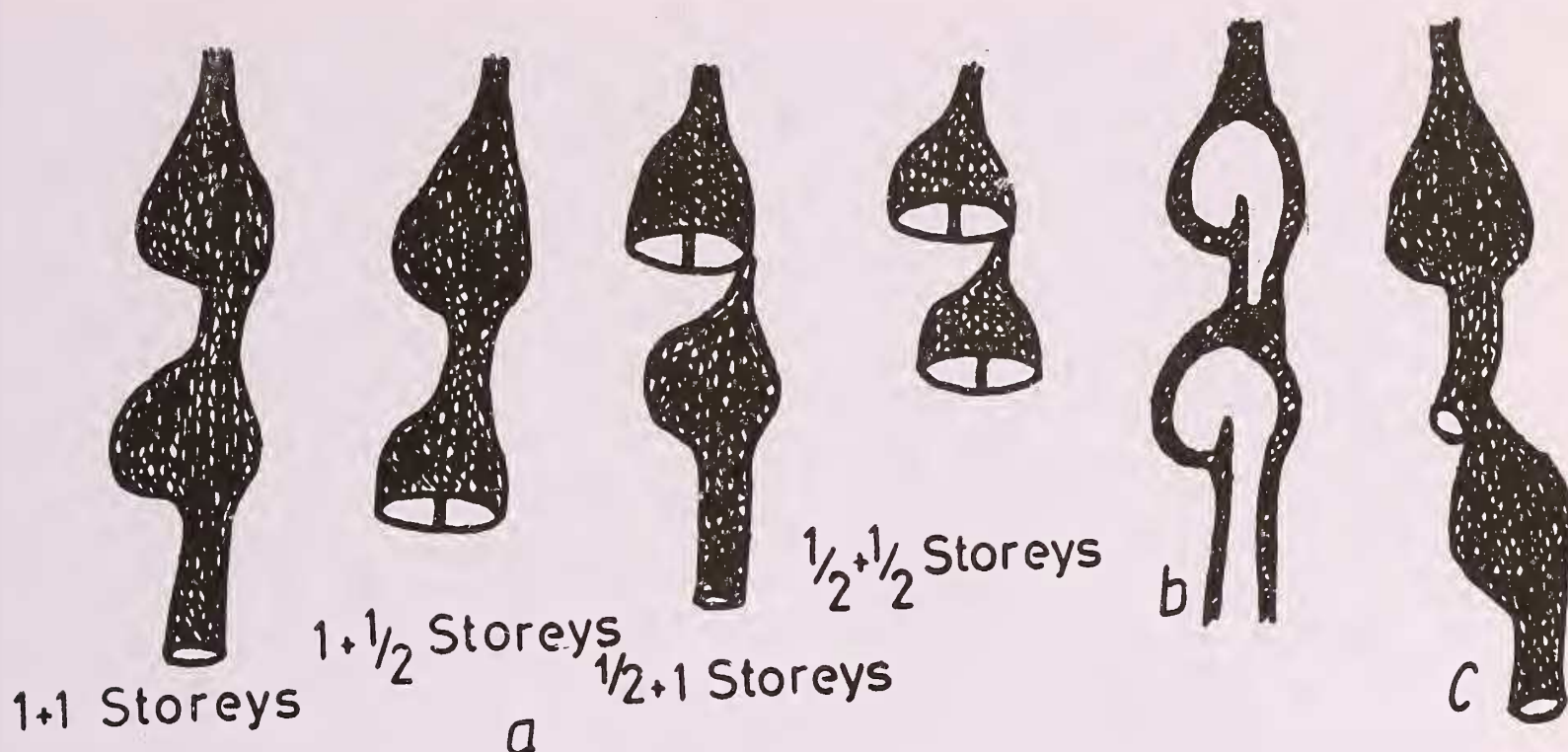


Fig. 4. a. Bistoreyed nests in external appearance; b. A bistoreyed nest in L.S. (upper storey blocked); c. A bistoreyed nest with both the 'alive' storeys.

mixed abnormal group. Chain-storeyed nests have been described by Davis (1985) also.

Various combinations of half built and completed nests are possible in chain storeyed nests (see Fig. 5).

C. MIXED ABNORMAL NESTS:

Such nests possess a combination of more than one kind of abnormality. Sometimes linear storeys as well as adjacent fusion may occur in the same nest complex. Combination of other abnormalities are also possible. This category of nests could be considered most complicated in terms abnormality (see Fig. 6).

Quantitative aspect of abnormal nests: A total 2996 nests were examined between 1982 and 1988 from four districts of Rajasthan state to study the trends of abnormalities. The findings are given in Table 1.

DISCUSSION

It is clear from table 1 that there is a trend

towards bistoreyed nests followed by fused nests in the state of Rajasthan. Why and how abnormal nests are prepared by the Baya Weaver Bird, is beyond the scope of this paper, however a few related points will be discussed .

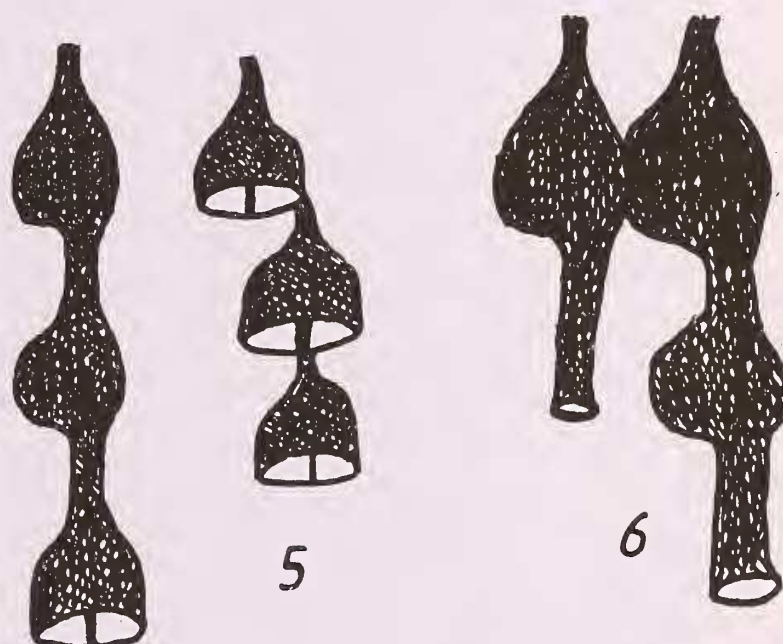


Fig. 5. Chain-storeyed nest.

Fig. 6. Mixed abnormal nest.

It is well known that armed host trees are preferred by the Baya for nesting, probably for

TABLE I
ABNORMAL NESTS OF *PLOCEUS PHILIPPINUS*

Dist.	Year	Total number of nests observed	Simple Abnormal Nests															Mixed Abnormal Nests	Total no. of Abnormal nests
			Monostoreyed Nests										Pseudo- storeyed Nests						
			Structural Abnormality								Orientational Abnormality								
			A	B	C	D	E	F*	G	H	I	J	K	L	M				
Alwar & Bharatpur	1982	1952	-	8	-	-	-	-	-	-	9	-	-	-	1	-	2	-	20
Alwar	1984	239	-	-	-	1	-	-	-	-	7	-	-	-	-	-	1	-	9
Udaipur	1987	226	6	-	1	-	-	-	-	1	1	2	-	1	-	-	5	-	19
Alwar	1987	123	-	-	1	-	3	2	-	-	1	2	-	-	-	1	6	-	18
Jaipur	1988	197	-	-	-	-	-	2	-	-	4	2	-	-	-	-	13	2	23
Alwar	1988	259	-	-	-	-	1	-	1	-	-	-	2	-	-	2	3	-	9
Total		2996	6	8	2	1	4	4	1	1	22	6	2	1	1	5	30	2	98

A. Bell Jar shaped; B. Buttressed; C. Blind; D. Closed; E. Stalkless; F. Multistalked; G. Chained; H. Meshed; I. Fused; J. Branched; K. Symmetrical; L. Stomach shaped; M. Completed nest with double opening.

* Multistalked nests seen on dicot trees are depicted here. Those seen on *Phoenix sylvestris* are not included.

safety. The nests are often tossed around by wind and get entangled by the spines at inconvenient angles. To overcome this problem buttressed or widestalked or multistalked or stalkless or even shortstalked nests may be fabricated. Such nests are least subjected to conditions like simple harmonic motion due to wind thrusts. Stomach shaped nests are equally good to avoid SHM due to their peculiar alignment.

Though bistoreyed nests are common in Rajasthan, field observations reveal that more than three storeyed nests are not present in the study area. Multi-storeyed nests were noticed by Davis (1985) and Ambedkar (1980) in those areas where comparatively long monsoon periods prevail. In Rajasthan, the monsoon period is very short (2 months). The period of two months is very short to fabricate 6 to 10 nests, hence extensive storeyfication cannot be expected. That is why 'long chains of nests' are very rare in Rajasthan.

'Intra bird nest' fusion was seen in all the cases; no 'inter bird nest' fusion was observed in any colony. It suggests that the Indian Baya Weaver Bird has only reached up to a 'colonial nesting' level and has not yet reached the 'social

nesting' stage like the social weaver bird (*Philetairus socus*) of South Africa.

The viewing of a double opening completed nest was quite an exciting experience, a rather rare happening in the breeding biology of the Baya Weaver Bird. An additional opening perhaps may be of use during emergency for escaping from the nest. It may be a useful device to shorten the length of the entrance tube to facilitate a larger number of feeding trips to keep pace with requirement of food for rapidly growing chicks. Though such nests have some advantages, the disadvantages are that they are quite prone to attack by predators.

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